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12 Justification (Reason for Modification EJO # TP # etc) Interagency Agreement (IAG) Air velocity measurements are required to support the landfill closure conceptual design			
13 Organization			
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8 Item	9 Page	10 Step	11 Proposed Modifications
2	3	2 0	Insert after second sentence "Also, this procedure describes the methods that will be used to measure landfill gas emissions on methane venting wells at the RF landfills "
3	3	3 0	Insert after "and/or collecting soil gas samples" - ", and/or measuring gas emissions rates,"
4	4	4 1	<u>Insert after third reference listing " Model 8340 Intrinsically Safe VELOCICHECK Air Velocity Operation and Service Manual. TSI Incorporated, January 1991</u>
5	7	5 0	Insert at end of section "Also, this procedure describes the use of the TSI VELOCICHECK® Air Velocity Meter (measuring in Standard feet per minute (S ft/min)) to measure gas emissions rates This is just one type of meter than gives dependable velocity readings "
6	23	5 0	<p>Insert after section 5 3 2 2</p> <p>"5 4 MEASURING LANDFILL GAS EMISSION RATES</p> <p>The TSI VELOCICHECK® Air Velocity Meter is a hand-held battery-operated meter that measures air velocity The measurement technique used is constant-temperature thermal anemometry in which the sensor is held at a constant temperature by a control circuit As the speed of air passing the sensor increases, more power is supplied to the circuit in order to hold the temperature of the sensor constant This extra-power supply is directly related to the air velocity</p> <p>5 4 1 Calibration of the TSI VELOCICHECK® Air Velocity Meter</p> <p>According to the Model 8340 Intrinsically Safe VELOCICHECK® Air Velocity Meter Operation and Service Manual, the calibration of the instrument taken care of prior to selling the product The calibration method is laser verified to ensure the highest accuracy measurement A certificate from the National Institute of Standards and Technology is issued with every instrument to verify that it has been calibrated It is recommended that each instrument is returned to the factory annually for recalibration This will assure that consistent and accurate readings are obtained</p> <p>If the instrument is a rental unit, the user will verify that the calibration updates have been maintained by the renting facility prior to collecting field data</p> <p>The meter's units of measurement is referenced to a set of standard conditions (70 °F and 14.7 psia) Standard velocity is the velocity the air would be moving if the temperature and pressure were at standard conditions Actual velocity is the velocity at which a microscopic particle of dust would be traveling if it were in the air stream If actual velocity of the gas emissions is required, the temperature of the air in each well will be measured in °F and the pressure of the air in each well will be measure in psia</p>

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11 Proposed Modifications

5 4 2 Operation of the Model 8340 VELOCICHECK®

Prior to taking velocity measurements, each methane well will be tightly coupled to a temporary one to two foot extension of PVC of similar diameter. The PVC extension will be outfitted with a sampling port that the probe end can fit into without obstructing air flow or changing the air velocity. The reading will be taken through this port rather than at the well exit so that ambient wind does not alter the test results. After completing the test, the temporary extension will be removed and the well will be properly secured.

The operator will use the following procedures to operate the meter

- Switch the unit on prior to going to the field to make sure it is operating properly. After five seconds the unit should begin displaying velocity readings of ambient air currents. Check the battery life by switching the unit to BATT mode and directly read the percentage of battery life remaining. (If the unit battery life falls below 15%, install new batteries)
- Fully extend the retractable probe by grasping the tip and pulling straight up
- Determine if fast or slow response reading is needed and switch the unit to the desired mode. Slow response gives the average reading of the flow of the past 12 seconds (one reading for each second), while a fast response gives the average reading of the flow of the past three seconds (one reading for each second)
- Orient the probe so that the air stream flows straight through the sensor window in the direction indicated by the arrow on the tip of the probe. The arrow on the tip of the probe should point downstream
- Insert the tip of the probe at the sample point (taking great care not to destroy the fragile circuit) and record the reading. The number of readings obtained will be determined on an as needed basis
- Retract the probe by aligning the sensor window with the front of the unit and pushing it firmly into the instrument case. The probe should be retracted when it is in transport
- Turn off the unit and inspect it for needed maintenance. If the probe tip is dusty carefully clean it in accordance with the manual instructions. No other decontamination procedures apply to this unit "

7 27 7 0

Insert at end of procedure "Air velocity readings will be recorded in the field notebook. Readings that will be documented include the velocity flow rate in S ft/min, the most accurate temperature in °F, and ambient air pressure in psia "



INTEROFFICE CORRESPONDENCE

DATE October 26, 1994

TO History File

FROM L J Peterson-Wright, OU5, 6, 7 Closures, Bldg 080, X8553

SUBJECT DMR NUMBER 94-DMR-002036 - LJPW-017-94

Steve Lynn of the S M Stoller Company, is to be the only recipient of the above referenced DMR
If you have any questions, please call me at X8553

LJPW cb

cc

Document Control (2)

SOIL GAS SAMPLING AND FIELD ANALYSIS

**EG&G ROCKY FLATS PLANT
EMD MANUAL OPERATION SOP**

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Environmental Management

**TITLE
SOIL GAS SAMPLING AND
FIELD ANALYSIS**

Approved By

/s/ J. E. Evered
(Name of Approver)

/ /
(Date)

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2.0 PURPOSE AND SCOPE

94-DML-002036 | This standard operating procedure (SOP) describes procedures that will be used at the Rocky Flats Plant (RFP) to conduct soil gas field surveys or headspace measurements of organic vapors in environmental samples. It also provides procedures for dynamic and passive collection of soil gas samples to be used in identifying volatile organic compounds (VOC) present at Individual Hazardous Substance Sites (IHSS) on the RFP site. Also, this procedure describes the methods that will be used to measure landfill gas emissions on methane venting wells at the RFP landfills. The requirements for application of these procedures to a given site will be specified in applicable project plans.

3.0 RESPONSIBILITIES AND QUALIFICATIONS

94-DML-002036 | Personnel performing VOC field surveys and/or monitoring with flame ionization detector (FID) or photoionization detector (PID) portable vapor meters, and/or collecting soil gas samples, and/or measuring gas emission rates, will be scientists, engineers, or field technicians with appropriate field experience and training provided under the supervision of another qualified person.

Only qualified personnel will be allowed to operate portable gas chromatographs (GCs) or vehicle-mounted GCs in mobile laboratories. Required qualifications vary depending on the activity to be performed. In general, qualifications will be based on education, previous experience, on-the-job training, and supervision by qualified personnel. The subcontractor's project manager will document personnel qualifications related to this procedure in the subcontractor's project QA files.

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4 0 REFERENCES

4.1 SOURCE REFERENCES

The following is a list of references reviewed prior to the writing of this procedure

A Compendium of Superfund Field Operations Methods EPA/540/P-87/001 December 1987

Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA
Interim Final EPA/540/G-89/004 October 1988

94-DNR-000036 | Model 8340 Intrinsically Safe VELOCICHECK® Air Velocity Operation and Service Manual, TSI Incorporated, January 1991

RCRA Facility Investigation Guidance Interim Final May 1989

Rockwell International Rocky Flats Plant Environmental Restoration Program. Quality Control Plan January 1989

Schuring, D G "Soil Gas Testing " HAZMAT World August 1989 pp 36-39

The Environmental Survey Manual DOE/EH-0053 Volumes 1-4 August 1987

Barsky, J B , S S , Que Hee and C S Clark American Industrial Hygiene Association Journal (46) 1985 p 9

Callendar, A B and A Bohrerud Proceedings of the Woodward-Clyde Consultants Professional Development Central Symposium St Louis, Missouri 1986

Hutzler, N J , L T Londo and T C Crittenden Proceedings of the ASCE Conference, Minneapolis, Minnesota American Association of Civil Engineers 1982 p 720

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site evaluation before and during the excavation of potentially contaminated soil These procedures may be used to aid

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(NERI), will number all second and third wire tubes appropriately

- g) Record the number or numbers of the sampler corresponding to the location on the base map and field notebook Also, record in field notes any samples which have more than one wire per tube
- h) Do not place tape, sticker, or glue on the glass tube
Stickers provided will adhere if placed on a dry cap

- 8 When packaging exposed tubes, do not use styrofoam or popcorn packing as this can potentially introduce a contaminant Enclose tubes in two plastic bags and wrap each package tightly with bubble wrap Complete NERI-WEST Submittal Forms, provided by NERI, to be shipped with samples Samples are to be placed in sealed containers Packaging, labeling, and preparation procedures for shipment are specified in SOP FO 13, Containerization, Preserving, Handling, and Shipping of Soil and Water Samples

5.4

MEASURING LANDFILL GAS EMISSION RATES

The TSI VELOCICHECK® Air Velocity Meter is a hand-held battery-operated meter that measures air velocity The measurement technique used is constant-temperature thermal anemometry in which the sensor is held at a constant temperature by a control circuit As the speed of air passing the sensor increases, more power is supplied to the circuit in order to hold the temperature of the sensor constant This extra-power supply is directly related to the air velocity

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5.4.1 Calibration of the TSI VELOCICHECK® Air Velocity Meter

According to the Model 8340 *Intrinsically Safe* VELOCICHECK® Air Velocity Meter Operation and Service Manual, the calibration of the instrument taken care of prior to selling the product. The calibration method is laser verified to ensure the highest accuracy measurement. A certificate from the National Institute of Standards and Technology is issued with every instrument to verify that it has been calibrated. It is recommended that each instrument is returned to the factory annually for recalibration. This will assure that consistent and accurate readings are obtained.

If the instrument is a rental unit, the user will verify that the calibration updates have been maintained by the renting facility prior to collecting field data.

The meter's units of measurement is referenced to a set of standard conditions (70 °F and 14.7 psia). Standard velocity is the velocity the air would be moving if the temperature and pressure were at standard conditions. Actual velocity is the velocity at which a microscopic particle of dust would be traveling if it were in the air stream. If actual velocity of the gas emissions is required, the temperature of the air in each well will be measured in °F and the pressure of the air in each well will be measured in psia.

5.4.2 Operation of the Model 8340 VELOCICHECK®

Prior to taking velocity measurements, each methane well will be tightly coupled to a temporary one to two foot extension of PVC of similar diameter. The PVC extension will be outfitted with a sampling port that the probe end can fit into without obstructing air flow or changing the air velocity. The reading will be taken through this port rather than at the well exit so that ambient wind does not alter the test results. After completing the test, the temporary extension will be removed and the well will be properly secured.

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The operator will use the following procedures to operate the meter

- 1 Switch the unit on prior to going to the field to make sure it is operating properly After five seconds the unit should begin displaying velocity readings of ambient air currents Check the battery life by switching the unit to BATT mode and directly read the percentage of battery life remaining (If the unit battery life falls below 15%, install new batteries)
- 2 Fully extend the retractable probe by grasping the tip and pulling straight up
- 3 Determine if fast or slow response reading is needed and switch the unit to the desired mode Slow response gives the average reading of the flow of the past 12 seconds (one reading for each second), while a fast response gives the average reading of the flow of the past three seconds (one reading for each second)
- 4 Orient the probe so that the air stream flows straight through the sensor window in the direction indicated by the arrow on the tip of the probe The arrow on the tip of the probe should point downstream
- 5 Insert the tip of the probe at the sample point (taking great care not to destroy the fragile circuit) and record the reading The number of readings obtained will be determined on an as needed basis
- 6 Retract the probe by aligning the sensor window with the front of the unit and pushing it firmly into the instrument case The probe should be retracted when it is in transport
- 7 Turn off the unit and inspect it for needed maintenance If the probe tip is dusty carefully clean it in accordance with the manual instructions No other decontamination procedures apply to this unit

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6.0 QUALITY ASSURANCE/QUALITY CONTROL

Quality Assurance (QA) and Quality Control (QC) activities will be accomplished according to the Quality Assurance Project Plan (QAPjP) and the project-specific Quality Assurance Addendum (QAA)

In addition to adhering to the requirements of the site-specific Field Sampling Plan (FSP) and any supplementary site-specific procedures, the minimum QA/QC requirements for this sampling activity are the following

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Air velocity readings will be recorded in the field notebook. Readings that will be documented include the velocity flow rate in S ft/min, the most accurate temperature in °F, and ambient air pressure in psia.